

IMPACT OF COGNITIVE STYLE ON PROBLEM SOLVING ABILITY AMONG UNDERGRADUATES

SUMANLATA SAXENA¹, RAJAT KUMAR JAIN² & HEMENT KUMAR JAIN³

¹Assistant Professor, Kalyan PG Arts and Commerce College, Bhilai, Chhattisgarh, India

²Assistant Professor, Shri Shankaracharya Mahavidyalya, Bhilai, Chhattisgarh, India

³Assistant Professor, Shri Rawatpura Sarkar College, Kumhari, Raipur, Chhattisgarh, India

ABSTRACT

Present study was conducted to find out the impact of cognitive style on problem solving ability of undergraduate students. Cognition is acquisition of knowledge which involves a series of mental skills. Style of thinking is used in cognitive psychology to describe the way an individual thinking, perceive and remember information or their preferred recurring pattern of perceptual and intellectual society. Also, culture provides people with a range of a cognitive style that are appropriate for different cognitive task in different context. Problem solving is a higher order cognitive process that requires the modulation and control of more routine or fundamental skill.

Cognitive style and problem solving ability both has the wide scope. Its knowledge is equally important to teacher, students and parents. Cognitive style is the approach taken toward solving a problem using problem solving ability. The study was conducted on 200 undergraduate students from various disciplines studying in different colleges located in Durg (Chhattisgarh) district. For the measure of cognitive style, Cognitive Style Inventory by **Jha** (1983) had been employed and for the measurement of problem solving Problem Solving ability test by **Dubey** (2008) had been employed.

It can be concluded that, there was no significant impact of cognitive style on problem solving ability of undergraduate student of integrated and split style. Similarly no significant impact of cognitive style on problem solving ability of male undergraduate students of integrated and split style. The significant difference was found in the problem solving ability of females of integrated and split style. A significant difference was also accounted in the problem solving ability of science and non science students. Discipline of study has a major role in determining the degree of problem solving ability.

KEYWORDS: Cognitive Style and Problem Solving Ability, Discipline of Study, Integrated and Split Style

INTRODUCTION

Problems are inseparable part of human life. One solves a problem in a particular way by which he satisfies himself while solving the problem. In this way he develops a style for solving the problem. Thus each person has a unique style of his own.

Cognition is the acquisition of knowledge which involves a series of mental skills. Neisser (1967) defines cognition as the process by which the sensory input is transformed, reduced and elaborated, stored, recovered and used.

Haber (1969) identified cognition as synonymous to human information processing. Djoudi (1950) and Mukerjee (1993) stressed the need of using cognitive strategies to attain the mastery of learning. These are the potentially conscious activities functions. It is used while learning to promote better learning and retention of learning for longer period.

Cognitive style has been viewed from different angles. According to Harvey (1963) cognitive style is the way an individual filters and processes stimuli so that the environment takes on psychological meaning. Goldstein and Blackman (1978) define cognitive style as a hypothetical construct that has been developed to explain the process of mediation between stimuli and responses. Here the term cognitive style refers to the characteristic way in which individuals conceptually organize the environment.

Cognitive style has been developed so that relationship between Stimulus and Response can be understood. By using it an individual can manipulate and organize his environment in certain ways. Cognitive style refers to the way an individual responds to his stimulus.

OBJECTIVES

- To study the impact of cognitive styles on problem solving ability of undergraduates.
- To study the difference between score of problem solving ability of integrated and split style male undergraduates.
- To study the difference between scores of problem solving ability of integrated and split style of female undergraduates.
- To study the effect of subject stream on the problem solving ability of undergraduates.

Hypotheses

H₀ There exists no significant difference between score of problem solving ability of integrated and split style undergraduates.

H₁ There exists no significant difference between score of problem solving ability of integrated and split style male undergraduates.

H₂ There exists no significant difference between scores of problem solving ability of integrated and split style of female undergraduates.

H₃ There exists no significant difference between score of problem solving ability of science and non-science undergraduates.

Sample

The sample consists of 200 male and female undergraduates from various disciplines studying in different colleges located in Durg district (C.G.).

Tools

- Cognitive Style Inventory by Jha (1983)
- Problem Solving Ability by Dubey (2008)

ANALYSIS AND DISCUSSIONS

To test the hypotheses data was collected accordingly and scoring was done as per the procedure stated in the manuals. According to the scores obtained by the cognitive style inventory all the subjects were categorized into five types of cognitive styles as systematic, intuitive, undifferentiated, integrated and split. Since a less member of students fall in systematic, intuitive, and undifferentiated style, they were not taken for further studies. Statistical analysis was employed on the scores obtained from subject of integrated and split type of cognitive style.

To find out the impact of cognitive style on problem solving ability 't' test was employed and findings are as follows.

Table 1: Table Showing Mean, Standard Deviation and 't' Value of Problem Solving Ability of Integrated & Split Style Undergraduates

S. No.	Groups	N	M	σ	t – Value
1.	Integrated Style undergraduates	70	12.8	4.00	1.53
2.	Split style undergraduates	109	11.19	3.62	
df = 177, P > .05, Not significant					

Table 1 shows that calculated 't' value for problem solving ability scores of integrated and split style undergraduates is less than table value at .05 level of significance. It indicates that there is no significant difference between the problem solving ability of integrated and split style undergraduates. The shown difference may be due to some error.

Table 2: Table Showing Mean, Standard Deviation and 't' Value of Problem Solving Ability of Integrated & Split Style Male Undergraduates

S. No.	Groups	N	M	σ	t – Value
1.	Integrated Style male undergraduates	34	11.76	4.29	0.133
2.	Split style male undergraduates	54	11.61	3.89	
df= 86, P > .05, Not significant					

It is revealed from table 2 that there is no significant difference between the problem solving ability scores of integrated and split style male undergraduates since the obtained 't' value is less than the table value at .05 level of significance. The difference between mean may be due to some error.

Table 3: Table Showing Mean, Standard Deviation and 't' Value of Problem Solving Ability of Integrated & Split Style Female Undergraduates

S. No.	Groups	N	M	σ	t – Value
1.	Integrated Style female undergraduates	36	12.38	3.67	2.14
2.	Split style female undergraduates	55	10.78	3.28	
df= 89, P < .05, Significant					

Table 3 indicates that obtained 't' value is 2.14 which is more than the table value at .05 level of significance, hence the value is significant. It means female undergraduates of integrated style differ in their problem solving ability to that female undergraduates having split style. Since the mean value of female undergraduates of integrated style is greater than split style undergraduates hence it can be concluded that integrated style female undergraduates are better problem solver.

So it can be inferred that in female undergraduates cognitive style plays a significant role on their problem solving ability.

Moreover a female with an integrated style is a good problem identifier and a good problem solver. Imagination and its critical analysis is very important in solving any problem. The nature of females of integrated style is very practical and rational. Hence, there exists a significant difference between the problem solving ability of integrated and split style female undergraduates.

Table 4: Table Showing Mean, Standard Deviation and 't' Value of Problem Solving Ability of Science and Non-Science Undergraduates

S. No.	Groups	N	M	σ	t – Value
1.	Science undergraduates	57	14.4	4.03	8.07
2.	Non-science undergraduates	122	10.2	2.83	
df= 177, P < .01, Significant					

Table 4 shows that calculated 't' value is greater than the table value at .01 level of significance (df = 177). The mean score indicates the difference in problem solving ability of science and non-science undergraduates. Science undergraduates are better problem solver than their counterpart non-science undergraduates. The undergraduates from science stream are well versed with mathematical operations, formulae, calculations logical reasoning etc.

CONCLUSIONS

It can be concluded from the study that cognitive style has no impact on problem solving ability of undergraduates. Integrated and split style undergraduates both are having average and above average problem solving ability.

In case of male undergraduates, cognitive style also does not play any significant role in - Problem solving ability. But in female undergraduates it plays a significant role upon problem solving ability, significant difference was found in the problem solving ability of integrated and split style female undergraduates. It was found that female subjects of integrated type of cognitive style were found to have good problem solving ability. Maximum of female subjects come in the range between an average and a high ability to solve the problem. The persons with an integrated style are able to change their actions quickly and with an ease relating to the situation. Generally girls are more sincere, disciplined and punctual towards their work as compared to the boys who are more rigid and casual. Moreover, girls are known to take a harmonious decision suiting to the current need. A significant difference was also accounted in the problem-solving ability of science and non-science undergraduates. Discipline of study has a major role in determining the degree of problem-solving ability. The subjects belonging to science streams are found to be good in problem solving as compared to their counterpart non- science undergraduates. The reason behind this may be because science facilitates logical reasoning, imagination of problem, abstract thinking at reflective level etc.

REFERENCES

1. Ackerman, P. L., & Woltz, D. J. (1994). Determinants of learning and performance in an associative memory/substitution task: Task constraints, individual differences, volition, and motivation. *Journal of Educational Psychology*, 86 (4), 487-515.

2. Amundsen, C. L., & Bernard, R. M. (1989). Institutional support for peer contact in distance education: An empirical investigation. *Distance Education*, 10 (1), 7-27.
3. Antonietti, A., & Gioletta, M. A. (1995). Individual differences in analogical problem solving. *Personality and Individual Differences*, 18 (5), 611-619.
4. Antonietti, A., & Gioletta, M. (1996). A study of some psychometric properties of the verbalizer-visualizer questionnaire. *Journal of Mental Imagery*, 20 (3-4), 59-68.
5. Atman, K. S. (1988). Psychological type elements and goal accomplishment style: Implications for distance education. *The American Journal of Distance Education*, 2 (3), 36-44.
6. Ausburn, L. J., & Ausburn, F. B. (1978). Cognitive styles: Some information and implications for instructional design. *Educational Communication and Technology*, 26 (4), 337-354.
7. Bartlett, F. C. (1932). *Remembering*. Cambridge, Mass.: Harvard University Press.
8. Entwistle, N.J. (1981). *Styles of Learning and Teaching*. London: Wiley & Sons.
9. <http://web.cortland.edu/andersmd/learning/cognitive.htm>
10. <http://www.instructionaldesign.org/concepts/cognitive-styles.html>
11. <http://dspace.mit.edu/bitstream/handle/1721.1/47046/cognitivestylepr00keen.pdf>
12. Kagan, Spencer (1992). *Cooperative Learning*. San Juan Capistrano, CA, Kagan Cooperative Learning
13. Kozhevnikov, Maria (2007). Cognitive Styles in the Context of Modern Psychology: Toward an Integrated Framework of Cognitive Style. Vol. 133, No. 3, 464 – 481
14. Lucas-Stannard, Paige (2003). Cognitive Styles: A Review of the Major Theories and Their Application to Information Seeking in Virtual Environments.
15. <http://www.personal.kent.edu/~plucasst/cognitivestyles.htm>
16. Online Journal of Distance Learning Administration, Volume II, Number III, Fall1999 State University of West Georgia, Distance Education
17. Sandhu, Daya Singh (1994). Cultural Diversity in Classrooms: What teachers need to know, ERIC Document Reproduction Service.

